Date. 1879	G.M.T. h m s	Pos. °	Dist. ″	Value.	Remarks.
Nov. 11	9 20	55 8		3	
	9 22	56 25		2	Under 1 wire.
	9 25	52 10		2	Over 1 wire.
	9 26 15	53 18		3	
	9 28	53 2		4	
	9 49	52 19			
	9 52		26·69	2	
	9 52 30		26·84	3	
	9 59 30	47 19		3	
	10 1	48 14		4	
	10 3	48 16		2	
	10 6 20	46 47		4	
13	7 44 10	51 25		2	
	7 46	49 30		2	
	7 47	50 5		2	
	7 48 30	51 27		1	
	7 51 40	50 19		3	
	10 55				Seen *s.p.* very faint.
15	9 8 15	235 59		5	Satellite seen with planet; very fine night.
	9 10 30		26·60	5	
	9 12	236 35		5	
	9 13 45	235 28	25·42	4	
	9 15 30	236 4		5	
	9 46	228 46		3	
	9 47 30		23·86	3	
	9 49 15	229 50		3	
	9 52	228 55		4	

November 1879.

New Double Stars. By S. W. Burnham, Esq.

Since the preparation of my last Catalogue and measures (*Memoirs of the Royal Astronomical Society*, vol. xliv.) the work has been continued at the Dearborn Observatory whenever circumstances permitted; and I desire, in advance of the publication of another Catalogue, to call attention to some of the double stars discovered during the present year, in order to give

observers who have the necessary instruments an early opportunity of measuring them.

The following, selected from a list of considerable length, are all naked-eye stars, and most of them important objects. I give the mean result of my measures, usually about three nights for each star.

No.	Star.	Pos. °	Dist. ″	Mags.	Epoch.	
1	β Scorpii	89·4	0·79	2 ...10	1879·53	A and B.
2	31 Virginis	28·7	3·56	6 ...12	·33	
3	48 Virginis	229·4	0·48	6 ... 6	·40	
4	86 Virginis	298·4	1·61	6 ...10·5	·37	A and B.
		274·2	1·72	11·5...13	·40	C and D.
		164·7	26·94	...	·33	A and C.
5	46 Eridani	57·0	1·47	6 ...10·5	·05	
6	26 Draconis	149·1	1·36	5·5...10·5	·28	
7	52 Hydræ	276·8	4·00	5 ...11	·42	
8	54 Herculis	175·4	2·56	5 ...12·5	·37	
9	η Cygni	209·0	7·20	4·5...13	·44	
10	65 Aurigæ	8·3	10·36	5 ...12·5	·00	A and B.
		26·8	36·10	...13	·00	A and C.
11	B.A.C. 4389	109·2	2·68	6 ...12	·28	
12	B.A.C. 5248	152·0	1·31	5 ...11	·28	
13	B.A.C. 6966	153·6	0·80	6 ...10	·56	
14	Rad. 6180	244·2	0·88	6·5... 8·5	·46	
15	Virginis 550	81·2	0·47	6 ... 6·5	·39	A and B.
		156·5	23·88	12·5	·37	AB and C.

1. *β Scorpii.*—This star has been known as a wide double for more than a century. After measuring the close pair of *ν Scorpii*, and while the highest micrometer eye-piece (900) was attached, I examined β. The conditions were very favourable for a star so far south, and the duplicity of the principal star was at once detected. I have only been able to get three measures of it during the present season. It is a very difficult pair, and far beyond any close pair hitherto discovered in the inequality of the components. I know of nothing among the large stars that is comparable with it, except *η Piscium*, discovered with this instrument last year. That is generally similar, but the principal star is of the fourth magnitude. Doubles of this description are the best possible tests for the quality of a telescope. In the southern hemisphere a Clark Refractor of 12 inches would probably show it. No second-class instrument, however large, will do it satisfactorily, if at all. There is not much doubt of this proving a physical system.

2. 31 *Virginis.*—This is comparatively an easy pair, and ought not to have been missed by Struve and others.

3. 48 *Virginis.*—A fine close pair, and well separated with the power used in measuring. The components seem to be exactly equal in magnitude.

4. 86 *Virginis.*—(A and C = Σ 1780 *rej.*) This star with a distant faint companion was noted by Struve, and inserted in his first Catalogue, but rejected as too wide and unimportant in the *Mensuræ Micrometricæ*. The 18½-inch shows both of these stars double. The attendant to the large star is very easily seen, and I think not beyond the reach of my 6-inch, but the companion to Struve's star is very difficult, and requires a large aperture. In fact, I did not detect it until after measuring AB two or three times. The components taken together form the closest quadruple system known. Sir John Herschel observed the Struve stars with the 20-foot Reflector at the Cape of Good Hope in 1836, and found the angle, 160°·3, but missed the close stars, as in many other similar instances.

5. 46 *Eridani.*—A fine easy pair.

6. 26 *Draconis.*—Very much like the last in distance and magnitudes.

7. 52 *Hydræ.*—Companion smaller than the two preceding, but more distant. This was found independently with the 6-inch, on Mount Hamilton, and very easily seen.

8. 54 *Herculis.*—The companion is quite faint, and requires a larger aperture than the three preceding pairs.

9. *η Cygni.*—Herschel, with the 20-foot, Reflector noted two distant stars which he called 18 magnitude (= H. 1455). His estimated places are—

	°		″
A and C	170 ±	:	20 ±
A and D	332·0	:	30 ±

They are very much brighter than the new star, and probably have, at least, twice the light. I have called them each 11·5 magnitude. My measures give the following places:—

	°	″	
A and D	P = 325·3	D = 46·17	1879·47
A and C	170·0	49·52	1879·47

The star in the *n.p.* quadrant is really the nearest. The new star is a very minute point, but has been readily seen by Edgecomb with his 9·4-inch Clark Refractor without any intimation of the direction from the principal star.

11. B.A.C. 4389.—The place of this star is, R.A. $13^h\ 0^m$: +45° 54′. It is a fine unequal pair.

12. B.A.C. 5248.—The place is, R.A. $15^h\ 45^m$: +55° 45′.

13. B.A.C. 6966.—Both close and unequal. R.A. $20^h\ 10^m$: $+25°\ 14'$.

14. *Radcliffe* 6180.—Heis gives this as a naked-eye star. R.A. $23^h\ 42^m$: $+46°\ 10'$.

15. *Virginis* 550.—A variable star discovered by Schmidt in 1866, and supposed to be variable from 5 to 8 magnitude. It is a fine close pair with a minute distant companion. This is B.A.C. 4531, R.A. $13^h\ 28^m$: $-12°\ 36'$.

In addition to the foregoing, I have divided the principal components of the following known pairs :—

Σ 157	Σ 888
Σ 258	Σ 2005 *rej.*
Σ 439	S. 752
Σ 707	H. 2661

Chicago, Nov. 15, 1879.

Observations of the Outer Satellite of Mars made at Dun Echt Observatory. By Lord Lindsay.

Date. 1879.	Dun Echt Mean Time.	Pos. Angle.	Cor. for Refraction and Phase.	Dist.	Cor. for Refraction and Phase.	Com-parisons.	Observer.
	h m	°	°	″	″		
Nov. 12	11 20·1	226·37	−·01	62·33	+·02	3	R. C.
,,	11 44·7	228·02	−·01	59·72	+·02	1	,,
,,	12 16·1	223·46	−·01	59·44	+·02	3	,,
,,	12 34·8	222·92	−·01	59·07	+·02	1	,,
Nov. 14	11 24·0	40·77	·00	43·48	+·02	1	,,
,,	11 33·2	39·57	·00	46·78	+·02	1	,,
,,	11 53·4	38·27	·00	47·46	+·02	1	,,
Nov. 17	10 34·6	233·77	−·01	64·14	·00	2	,,
,,	10 46·3	233·16	−·01	64·78	·00	2	,,
,,	10 54·6	232·57	−·01	62·57	·00	2	,,
,,	12 9·1	229·77	−·02	61·65	+·01	1	J. G. L.
,,	12 23·2	229·47	−·02	64·07	+·01	1	,,
,,	12 33·1	227·70	−·02	61·35	+·01	1	,,
,,	12 47·7	227·33	−·02	62·06	+·01	1	,,
* ,,	13 13·7	225·90	−·02	57·13	+·01	1	,,
* ,,	13 33·7	225·50	−·02	63·58	+·01	1	,,

* The last two observations are probably vitiated from the fact of *Deimos* passing very close to a star equal to itself in brightness. In fact, during these two observations they appeared as a single object, the centre of which may not have coincided with that of the satellite.